Amendments to the Specification

Please replace paragraphs beginning on page 3, line 24 and ending on page 4, line 22, with the following paragraphs:

-- In accordance with the principles of the present invention, the above and other objectives are realized in an image display device comprising a first re-size means for reading out image data from a first memory and for re-sizing the read-out image data, a second memory for storing the image data re-sized by the first re-size means, a display control means for reading out image data from the second memory and re-sizing the image data in accordance with a magnification change operation so that the display means displays thereon an image of the re-sized image data, and a control means which instructs the display control means to make the display means display the re-sized image without newly reading out the image data from the first memory when the magnification change operation is being carried out, and which, after the magnification changing operation is fixed, instructs the first re-size means to re-size image data newly read out from the first memory in accordance with contents of the fixed magnification change operation.

When resolution of the image data read out from the first memory becomes insufficient after the magnification change operation is fixed, the image data is stored in the second memory without being re-sized and an image in a desired area is read out from the second memory by the display control means to be displayed in the re-sized form. Further, when the contents of the fixed magnification change operation correspond to a predetermined condition, the control means stores the image data newly read out from the first memory into the second memory without re-sizing it. An image displaying method and a program computer-readably recorded on a recording medium which include similar features are also described.

In further accord with the present invention, a video signal processing apparatus comprising an image pickup means for picking up an image, a first memory for storing the picked-up image, a re-size means for reading out the image from the first memory and resizing the read-out image, a second memory for storing therein the image re-sized by the re-size means in order to display the image, and a resize display means for reading out an image in a desired area from the second memory to re-size and display the image in the desired area. The re-size display means reads out the image in the desired area to re-size and display the read-out image while a desired magnification change operation is carried out. After the magnification change operation is fixed, an original image is read out from the first memory and re-sized by the re-size means to be stored in the second memory, and the desired area of the re-sized image is displayed without re-sizing. When the resolution of the original image becomes insufficient in enlarged image display, after the magnification change is fixed, the original image is stored in the second memory without being resized and the image in the desired area is read out from the second memory by the re-size display means to be displayed in the re-sized form. A video signal processing method including similar features is also described.

The video signal processing apparatus further comprises a compression means for compressing picked-up image and an expansion means for expanding the compressed image. The video signal processing apparatus may also include a raster-to-block conversion means for inputting raster-sequentially an image signal and generating block-sequentially an image signal of a desired block size, a block compression means for receiving the image signal generated block-sequentially by the raster-to-block conversion means and compressing this signal, a block expansion means for expanding the image signal which is received block-sequentially

and compressed by the compression means and block-to-raster conversion means for receiving block-sequentially an image signal and generating an image signal raster scquentially. --.

Please amend paragraphs beginning on page 11, line 6 and ending on page 12, line 20, as follows:

-- FIG. 2 shows a case where an image is enlarged from zoom magnification 1. ~~Parts (a--1) and (a--2) of FIG. 2 show~~ Reference numerals 210 and 212 in FIG. 2 denote an operation example when a variable magnification manipulation is carried out to realize the display in a zoom state during setting of the re-size magnification. The ~~part (a--1) of FIG. 2 shows an image which~~ image 210 is obtained by expanding image data of the recorded image in the compression and expansion circuit 32, re-sizing the thus-obtained image data in the re-size circuit 17 so that the image corresponds to an image size of the image display unit 28, and then writing the image data thus processed into the image display memory area 22. When the re-size magnification is not yet determined, an image of a subject area within the image display memory area 22 as shown in the form of a rectangle (indicated by a solid line or a broken line) within the ~~part (a--1)~~ image 212 of FIG. 2 which is designated by the magnification button and the position button is enlarged through the interpolation process to be displayed by the re-size display circuit 24. With this method, the monitor image becomes rough as shown in the ~~part (a--2) of FIG. 2~~ image 212. However, since the re-size display can be realized by only changing over a read area, it is possible to attain the reproduction zoom quickly and with less power consumption.

~~Parts (b--1), (b--2,) and (b--3) of FIG. 2 show~~ Reference numerals 214, 216 and 218 in FIG. 2 denote an operation example after contents of the variable magnification manipulation

are determined, i.e., the re-size magnification is determined. The ~~part (b—1) of FIG. 2~~ image 214 shows a recorded original image. After image data of the recorded original image is expanded in the compression and expansion circuit 32, the image data of the original image is newly re-sized with a predetermined magnification determined through the variable magnification manipulation in the re-size circuit 17 so that the image becomes of image quality necessary and sufficient for the display resolution of a display device, and then the image data thus processed is written into the image display memory area 22 in a manner as shown in the ~~part (b—2) of~~ image 216 in FIG. 2. --.

Please amend paragraphs beginning on page 13, line 6 and ending on page 13, line 20, as follows:

-- After the variable magnification manipulation is completed to determine the magnification, the display state shown in the ~~part (a—2) of~~ image 212 in FIG. 2 is changed over to the display state shown in the ~~part (b—3) of~~ image 218 in FIG. 2. In this case, of the image data of the image shown in the ~~part (b—2) of~~ image 216 in FIG. 2, the image data in the area designated by the position button is not re-sized. Therefore, enlarged display of an image having high definition can be realized.

When the zoom magnification is not so large, i.e., the final display resolution is lower than the resolution of the original image, the original image is reduced from the image shown in the ~~part (b—1) of~~ image 214 in FIG. 2 to the image shown in the ~~part (b—2) of~~ image 216 in FIG. 2. --.

Please amend paragraph beginning on page 13, line 26 and ending on page 14, line 10, as follows:

-- ~~Parts (a—1) and (a - 2) of FIG. 3 show~~ Reference numerals 220 and 222 in FIG. 3 denote states of the image display memory area and the monitor in the middle of carrying out the variable magnification manipulation, respectively. Similarly to the case of FIG. 2, while the zoom state at a time when the variable magnification manipulation is being conducted is displayed, an image whose the image data is already stored in the image display memory area, is enlarged to be displayed. This stored image to be displayed was subjected to the reduction processing such as thinning-out of the image data, and the resolution thereof is deteriorated. --.

Please amend paragraph beginning on page 14, line 16 and ending on page 14, line 20, as follows:

--. On the other hand, ~~parts (b - 1) to (b - 3) of FIG. 3 show~~ reference numerals 224, 226 and 228 in FIG. 3 denote a state at a time when the variable magnification manipulation is carried out and then the display of a zoom state is carried out during setting of the re-size magnification. --.

Please amend paragraph beginning on page 14, line 21 and ending on page 15, line 3, as follows:

-- After the recorded original image data is expanded in the compression and expansion circuit 32, the original image data is then newly re-sized with a predetermined magnification determined through the variable power magnification in the re-size circuit 17 so that the image becomes of image quality suitable for the display resolution of a display device, and the image

data thus processed is written into the image display memory area 22 in a manner as shown in the ~~part (b—2) of~~ image 226 in FIG. 3. --.

Please amend paragraphs beginning on page 15, line 8 and ending on page 17, line 3, as follows:

-- Then, the display state of the ~~part (a—2) of~~ image 222 in FIG. 3 is changed over to the display state as shown in the ~~part (b—3) of~~ image 228 in FIG. 3. In this case, of the image data in the ~~part (b—2) of~~ image 226 in FIG. 3, the image data in the area designated by the position button is not re-sized. Therefore, similarly to FIG. 2, the image having high definition is displayed.

If the zoom magnification is further increased from the state of FIG. 3, i.e., the enlargement rate is increased so that the resolution of the original image becomes lower than that of a display device, the image quality in case of enlargement made by the re-size circuit 17 will become equal to that in case of enlargement made by the re-size display circuit 24. Accordingly, when the magnification is set equal to or larger than that shown in FIG. 3, it is more advantageous to re-size the image by only the re-size display circuit 24 as shown as images 230, 232, 234, 236 and 238 in FIG. 4 in terms of a capacity of the image display memory area 22, and the like. This is because the re-size processing for image data of the whole image is required for the image display memory, whereas only the image data in the image area intended to be displayed needs to be re-sized in the re-size display circuit. In addition, since an access speed to the memory 60 such as a memory card is generally slower than that to an internal memory, the processing speed is also easy to be increased.

FIG. 5 shows a reproduction zoom processing sequence in this embodiment. When the

magnification button is depressed (Step S10), the re-size display circuit 24 re-sizes and displays an image of an area of the image display memory area 22 designated by the magnification button and the position button (Step S14). This operation is continuously carried out until it is detected that the magnification button ~~has become free from its depression~~ is no longer depressed to determine the magnification (Step S12). When the magnification button is free from its depression, the re-size circuit 17 re-sizes the original image to reconstruct the image data in the image display memory area 22 (Step S20), and then an area designated by the position button is displayed without the image data therein being re-sized by the re-size display circuit 24 (Step S22). At this time, when the display magnification is not changed (Step S16), a currently stored image data in the image display memory area 22 is used as it is to, display the area designated by the position button without the image data therein being re-sizes for the display (Step S22). --.